

Historic, Archive Document

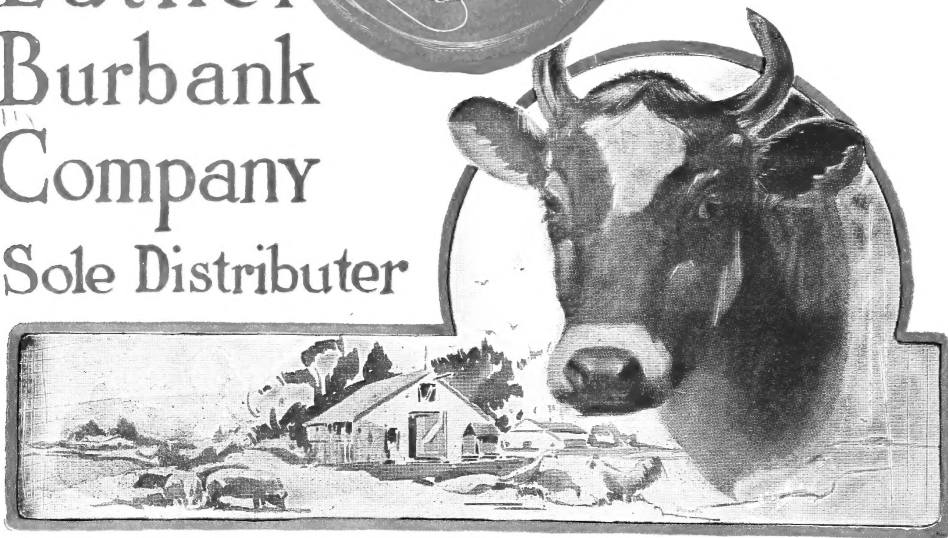
Do not assume content reflects current scientific knowledge, policies, or practices.

1913



Luther Burbank's Spineless Cactus

The
Luther
Burbank
Company
Sole Distributer



General Offices: Exposition Bldg., Pine and Battery Sts.
San Francisco, California

GENERAL OFFICES

EXPOSITION BLDG.

Pine and Battery Sts.
SAN FRANCISCO, CALIFORNIA

LOS ANGELES OFFICE:
402 Van Nuys Building

Experiment Farms, Santa Rosa, California
Not Open to the Public.

Proving Grounds and Nurseries, Sebastopol,
California.
Not Open to the Public.

Demonstration Station, Broadmoor,
Oakland, California.
OPEN TO THE PUBLIC

Seed Farms, Santa Clara Valley, California.

Spineless Cactus Nurseries,
Santa Rosa and Livermore Valley.

Warehouse and Distributing Point,
Oakland, California.

Address all communications to the General
Office at San Francisco, California.

LUTHER BURBANK
SANTA ROSA, CALIF.
U. S. A.

In these modern times a man must confine his efforts to a single occupation if it is to be well done.

To be an extensive and successful producer of new forms of plant life and a successful merchant on a large scale is perhaps beyond the limit of any one man and I have found it necessary either to confine myself wholly to selling my new varieties of plant life or discontinue development work.

Greatly preferring to devote my entire energies to the production of new varieties, I have disposed of the sales department to a corporation which will manage, market and carry on exclusively the business of selling the various new forms of plant life which I have evolved.

MANY HUNDREDS OF THESE PRODUCTIONS, ABSOLUTELY NEW TO MANKIND AND MORE USEFUL AND VALUABLE THAN THOSE NOW KNOWN, ARE ALREADY COMPLETE AND AWAIT INTRODUCTION.

This corporation, The Luther Burbank Company, is the sole distributor of the Luther Burbank Horticultural productions, and from no other source can any one be positively assured of obtaining genuine Luther Burbank Production.

To give each purchaser a guarantee of receiving original Burbank creations, this corporation has originated a trademark. The name "Burbank" has been so indiscriminately and fraudulently used that it has been in danger of losing, in a measure, its true significance. Every package of seed and every plant sent out from this corporation will have this trademark on it for your protection. All fraudulent uses of the same will be vigorously prosecuted and any information that will give knowledge of its misuse will be welcome.

Signed,

A handwritten signature in cursive script, reading "Luther Burbank". The signature is written in dark ink and is positioned to the right of the word "Signed,".

The Spineless Cactus

How to Judge Novelties---Look to Their Source

The greatest inconvenience and injustice is not misunderstanding, prejudice, envy, jealousy, ignorance or ingratitude, but that purchasers are so often deceived by various unscrupulous dealers who, taking advantage of the name "Burbank," hoist on the public green carnations, hardy bananas, half wild, thorny cactus, for Burbank thornless ones, blue roses, seedless watermelons, cigars, soap, real estate, magazine articles, obtaining money or positions under false statements of having been in my employ, and a thousand other similar schemes; and by outrageous misrepresentations or the change or addition of a word or two from the cor-

rect descriptions, deceiving purchasers, even when a genuine product of real value may happen to be offered.

Wise planters procure their cuttings and plants from the original source. Tons of so-called "thornless" cactus cuttings have been sold to unsuspecting customers as "Burbank's" or "just as good as Burbank's" by a few dealers who well know that they are not in any respect what they claim for them.



History of the Spineless Cactus

by Luther Burbank

For more than fifty years I have been quite familiar with "thornless cactus" of many species and varieties. In fact, one of the first pets which I had in earliest childhood was a thornless cactus, one of the beautiful Epiphyllums.

The Phyllocactus and many of the Cereus family are also thornless, not a trace to be found on any part of the plants or fruit. Thus the somewhat indefinite popular name of "spineless cactus" has been used by persons unacquainted with these facts, for be it known that "thornless cactus" is no more of a novelty than a "thornless" watermelon.

But among the Cacti, which grow to an immense size with great rapidity and which can be readily cultivated in garden, field or desert, no perfectly thornless ones

were known and very little interest taken in the cacti of any kind, either thorny or thornless, as to their agricultural or horticultural value until some seventeen years ago when the work of improvement was taken up on my experiment farms, and improved perfectly smooth, rapid-growing varieties had been produced and made known.

Some of the best growers among these will produce five to ten times as much weight of food as will the wild thorny ones (which some ignorant or unprincipled dealers have recommended for cultivation), under exactly the same conditions. These wonderful results were not unexpected as the genus Opuntia is a surprisingly variable one, even in the wild state.

The best botanists—even those who have made the *Opuntias* a special study—declare it to be one of the most difficult genera to classify, as new forms are constantly appearing and the older ones so gradually and imperceptibly merge together. The facts, without doubt, are that their ancestors had leaves like other vegetation and were as thornless as an apple tree, but in ages past were stranded in a region which was gradually turning to a desert, perhaps, by the slow evaporation of some great inland lake or sea.

Being thus stranded the plants which could adapt themselves to the heat and drought which as the years passed by became each season more and more severe, survived, at first by dropping the leaves, thus preventing too much evaporation, leaving the fat smooth stems only to perform the functions of leaves.

The *Opuntias* even to this day always shoot out very numerous rudimentary leaves, which persist a few days or weeks and then, having no function to perform, drop off. These rudimentary leaves which always appear for a time on the young slabs are often mistaken for big thorns by those who are not familiar with the growth and habits of the plant.

But the *Opuntias* had yet to meet another enemy; desert animals were hungry for their rich stores of nutriment and water, so the rudimentary leaves were supplemented by the awful needle-like thorns placed at exactly the right angles for the best defense.

Some seventeen years ago, while testing the availability of a great number of proposed forage plants from the various arid regions of the world with a view to the improvement of the most promising, I was greatly impressed with the apparent possibilities in this line among the *Opuntias*, which from their well-known vigor and rapidity of growth, easy multiplication and universal adaptability to conditions of drought, flood, heat, cold, rich or arid soil, place them as a class far ahead of all other members of the great cactus family, both as forage plants and for their most attractive, wholesome and delicious fruits, which are produced abundantly and without fail each season.

These fruits, which are borne on the different species and varieties, vary in size from that of a small peanut to the size of a very large banana and in colors of crimson, scarlet, orange, yellow and white, and also shaded in various colors like apples, pears, peaches and plums, and with more various attractive flavors than are found in most other fruits except, perhaps, the apple and the pear, the product of a single plant being often from 50 to 200 pounds per annum, some bearing one crop, others two or more each season like the figs, the first or main crop ripening as the second comes into bloom on the same plants.

The *Opuntias*, from root to tip, are practically all food and drink and are greatly relished by all herbivorous animals, and for this very reason have had to be on the defensive, and perhaps nowhere in the whole vegetable kingdom have such elaborate preparations been made; the punishment inflicted is immediate, the pain severe and lasting, often ending in death, so that all living things have learned to avoid the *Opuntias* as they do rattlesnakes, and notwithstanding their most delicious and nourishing fruit produced unflinchingly in greatest abundance have never before been systematically improved by the Agriculturalist and Horticulturalist as their merits so well deserve.

By my collectors and others, for the earliest experiments in this work, the best *Opuntias* from all sections of Mexico, from Central and South America, from North and South Africa, Australia, Japan, Hawaii and the South Sea Islands, were secured. The United States Agricultural Department at Washington, through my friend, Mr. David G. Fairchild, also secured eight kinds of partially thornless ones for me from Sicily, Italy, France and North Africa, besides a small collection of Mexican wild thorny ones which were in the Government greenhouses at the time. Besides these I had the hardy wild species from Maine, Iowa, Missouri, Colorado, California, Arizona, New Mexico, Dakota, Texas and other States.

All these were grown and their agricultural and horticultural values studied and compared with great care.

Many so-called thornless or partly thornless ones were obtained, but not one among the thousands from all these sources was free from thorns and spicules, and even worse, those which were the most promising in these respects often bore the poorest fruit, were the most unproductive of fruit or produced less fodder, or were less hardy than the wild thorny species and varieties.

The first work was to select the best of these, cross them, raise numerous seedlings, select the best of these and so continue hoping for improvement.

One of the first and not unexpected facts of importance to be observed was that by crossing, the thorns were often increased rather than diminished, but not so with all. Some very few still became even more thornless than their so-called

thornless parents with greatly increased size and quality of leaves (raquettes or slabs), and among them a combination of the best qualities of both parents with surprising productiveness of slabs for feeding.

The work is still in progress, but on a still larger scale and now these improved Opuntias promise to be one of the most important food-producers of this age, some of these new creations grown from the same lot of seed yielding fully ten times as much feed as others under exactly the same conditions.

Old half thornless ones have been grown for ages. Among the very numerous wild seedling Opuntias, partially thornless ones have appeared from time to time and these have been growing gen-



The Wild Thorny Cactus

erally unnoticed here and there in every part of the earth where the thorny ones grew, the seeds no doubt scattered by birds and other agencies. Some of these bore fairly good but seedy fruits and have been locally cultivated for ages, but have never received specific horticultural names or descriptions, though the fruits of these and the thorny ones have long been used extensively as food and are the principal source of food for millions of human beings in Southern Europe, North Africa, Mexico and other lands, for about three months in each year.

Systematic work for their improvement has shown how pliable and readily moulded is this unique, hardy denizen of rocky, drought-cursed, wind-swept, sun-blistered districts, and how readily it adapts itself to more fertile soils and how rapidly it improves under cultivation and improved conditions.

Some one asks: "Won't they run wild again and produce thorns, when placed under desert conditions?"

Has the "Burbank" plum, which though introduced twenty-two years ago, and is now more widely grown than any other plum on this earth, shown a tendency to be different in Africa, Borneo, Japan, Egypt, Madagascar or France? No, it is the same everywhere and the residents of Chicago, Auckland, London, San Francisco, New York and Valparaiso consume them in great (and rapidly increasing) numbers of carloads each season. The same may be said of the later introduced Wickson, America and numerous other plums and of my improved fruits and flowers which are extensively grown and generally offered for sale by most responsible firms in all civilized countries and are generally slowly but very surely replacing the old and heretofore standard varieties.

It will be so with these "new creations" in *Opuntia*. Tens of thousands of others not now ready to be distributed are under test, this catalog partially describing only the beginnings of a great work with the *Opuntias*, which in importance may be classed with the discovery of a new continent.

Does this work, which has been only just briefly outlined, mean anything?

Intelligent people everywhere know well that it means a new agricultural era for whole continents like Australia and Africa, and millions of otherwise useless acres in North and South America, Europe and Asia.

And now during the past three years the United States Department of Agriculture has despatched agents to all parts where cacti grow to look up this matter among those who had for years been feeding the wild, thorny ones to their stock with good results when properly prepared by fire, though it is acknowledged that thus prepared, a portion of their nutritive value is lost and though the dangers of loss from feeding to stock are lessened, are not by any means made safe, even by singeing or any other process, while many of these new thornless ones are as safe to handle and as safe to feed as beets, potatoes, carrots or pumpkins.

But let it be understood that these thorns are not growing on the wild *Opuntias* for ornament any more than poison fangs, teeth, claws and stings are possessed by various animals.

They are for defense, and when deprived of these defenses they must be protected from stock like any other feed grown in farm, fields or gardens.

Still some doubter who has no knowledge of desert conditions or of these new plants will say, "Will it pay?" Does anything pay? Some people seem to think that corn, wheat, oats, barley, cotton, rice, tobacco, melons and potatoes pay.

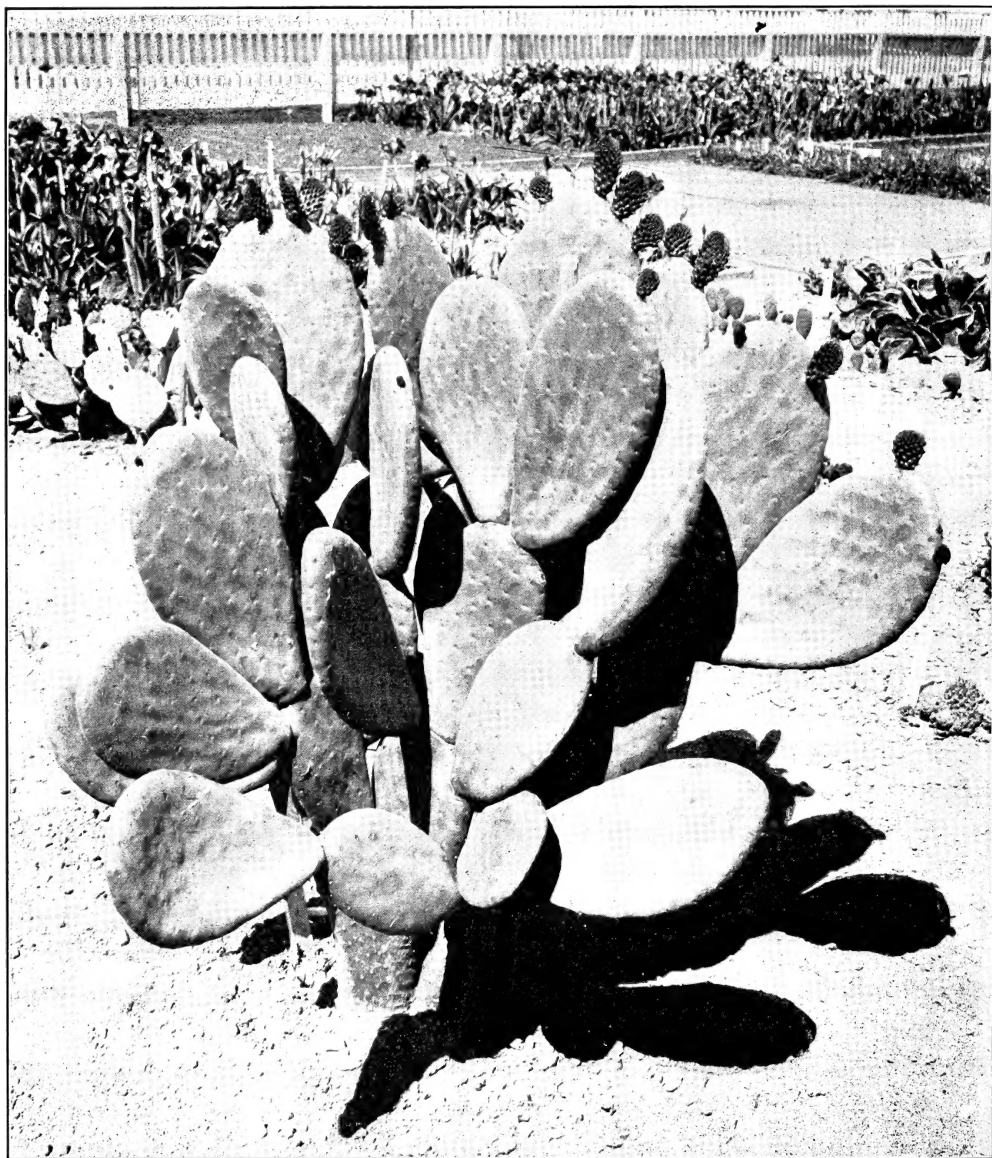
How many tons of hay, beets or potatoes can be raised each season on an acre of good soil? Yes, well, by actual weight in the summer of 1906 in the cool coast climate of Sonoma County, Cal., on a heavy, black "adobe" soil, generally thought wholly unsuited for cactus, my new *Opuntias* produced the first year, six months from single rooted leaves, planted about June 1, an average of $47\frac{1}{2}$ pounds per plant or one-fourth acre, yielding at the distance planted ($2\frac{1}{2} \times 5$ feet), at the rate of 180,230 pounds, over ninety tons, of forage per acre.

Some of the best varieties produced very much above this average.

Though planted much too closely for permanent field culture, yet these notes are of interest on a subject of which little has been known.

These *Opuntias* are always expected to and do produce nearly or quite double as

much feed the third and succeeding years as they do the second season of planting. Yet, I would not expect one-fourth the above yield on desert soil without irrigation but would expect nearly or quite twice as much as the yield mentioned above in a very warm climate with one or two light irrigations each season.



The Spineless Cactus

These improved *Opuntias* must, of course, be fenced from stock when young, but after two or three years' growth stock may safely be turned loose among them as with age the main stem becomes woody and will not be injured, but on removal of stock will at once make a most rapid new growth.

The leaves are to be fed to stock at any season throughout the whole year when most needed, and in countries where great numbers of valuable stock are lost in times of unusual drought, will be of inestimable value and will also prove of enormous value in less arid countries as a common farm or orchard crop, even on the best agricultural soils, but more especially on barren, rocky, hill and mountain sides and gravelly river beds, which are now of no use whatever.

The small, hard, wild thorny cactus has been a common every-day food for horses, camels, mules, oxen, growing and beef stock, dairy cows, pigs, and poultry for more than fifty years.

Though millions have died from the thorns*, yet no systematic work for their improvement had been taken up until some seventeen years ago; now agriculturists and horticulturists in every land are deeply interested, and the governments of all countries are taking measures to secure a stock of the improved Burbank *Opuntias* to avoid if possible the too common occurrence of famines, for the *Opuntias* can remain uncultivated and undisturbed year after year, constantly increasing in size and weight until needed; then each acre will preserve the lives of a hundred animals or even human beings for months until other food can be obtained.

The wild cactus is generally prepared for stock by singeing the thorns with fire, yet this never destroys all of the thorns.

Those who have fed the wild cactus extensively acknowledge that cattle are often seen with blood dripping from their mouths, and that their throats and tongues become at last inflamed, very painful and hard, like a piece of sole leather.

How would you enjoy being fed on needles, fish-hooks, toothpicks, barbed wire fence, nettles and chestnut burrs?

The wild, thorny cactus is and always must be more or less of a pest.

Millions of cattle, sheep, goats, hogs, ostriches and other animals have been destroyed by it.

The new thornless ones will withstand flood, drought, heat, wind and poor soil better than the wild ones and will produce one hundred tons of good food where the average wild ones will produce ten tons of inferior food.

Dry seasons, which are certain to come, have been and will continue to be the source of irreparable loss to stock raisers.

Many of the owners of the great stock ranges have seen the necessity of some insurance against these fearful losses and are devoting certain tracts to these new cactus plants to avert this danger as well as for supplementing the usual feed.



*The wild cactus is prepared by boiling or steaming in Australia in times of drought, but even though great loss of stock is sometimes reported when thus prepared, some are saved from otherwise certain starvation.

Professor J. P. Leotsakos says in regard to the cactus:

"The old, somewhat thorny fruiting cactus is, in my native country, one of the principal foods for both opulence and poverty during three months of the year when it is abundant. These pear fruits are delicious, exceedingly nutritious and healthful. I would rather, by far, have half a dozen of them for breakfast than the best beef-steak or any other food. The fruit of these perfected cacti is the best fruit food for man or beast, and Mr. Burbank is a great benefactor in perfecting the cactus. If he lived in Greece a monument would be erected to him in every city. I have never seen in all the world such an astounding crop of fruit as I saw on Burbank's new varieties of truly spineless cactus at Santa Rosa, California."

Prof. J. P. Leotsakos is a graduate of the Royal Classical College of Athens and a teleiofoitos of the law department of the University of Athens, and belongs to one of the best-known families of contemporary Greece. His father was the commander of the revolutionary army that brought about the deposition of King Otho in 1862, afterwards an aide-de-camp to the present King George, and finally Senator from Lakonia in the Greek Parliament at Athens.—D. N. Bottassi, Consul-General of Greece.



An Australian Scene—Feeding Wild Thorny Cactus to Sheep in Times of Drought. Often Death Was the Penalty, Due to the Thorns—But Many Sheep Were Saved.

Results of Feeding Wild Thorny Cactus in Various Parts of the World

For hundreds, probably thousands of years, the great, rapid-growing, desert thorny cactus has furnished food for stock and fruit for man, especially in Southern Europe, Northern Africa, Australia and the United States.

The whole plant furnishes nutritious food in abundance, yet great pain and often death was the penalty for using it. In addition to the slabs, which furnish the forage, the fruit produced many tons to the acre, is very valuable as a stock food, owing to the high percentage of sugar.

The slabs of the wild cactus are covered with a mass of stout thorns, often from one to two inches in length, and as sharp as needles.

Frequently, in times of drought, the hunger-driven livestock endeavored to reach the rich succulent slabs, so jealously guarded by the thorns, and as a result would often be seen with blood dripping from their mouths.

Stockmen and herders, for hundreds of years, have availed themselves of this source of food supply, and it is frequently a common sight to see men gathering from the desert the slabs, which are to be fed to cattle, sheep and hogs.

The custom has been to burn or singe the thorns or spines from the slabs before feeding to the stock. The process of singeing was necessarily a slow and expensive one, and this expense, coupled to imperfect results in ridding the slabs of all the

thorns, was the only obstacle to a greater use, for otherwise the forage properties of the wild, thorny cactus are excellent and most satisfactory to the stockmen.

A sort of gasoline blow-torch has been used with considerable success, particularly in the southwestern portion of the United States and in Australia. Boiling, as well as singeing by other methods, has been resorted to and with such success that many thousands of cattle and sheep have been saved from certain starvation during droughts.

However, no method has been wholly satisfactory, as it seems to be utterly impossible to get rid of all the thorns and do it on an economical commercial scale.

In North Africa, according to M. A. Johanne, in the *Journal D'Agriculture Tropicale*, (Paris), the thorny cactus is considered a forage plant of great importance in the feeding of stock. The wild cactus has been taken under cultivation, and plantations have been cultivated for

a period as long as fifty years, and the plants are still vigorous and productive. By adding a very small quantity of chopped straw to the slabs, excellent results are had in feeding beef cattle, milch cows, goats, etc.

From Hawaii the manager of one of the largest ranches writes:

Haleakala Ranch,
Makawao, Maui, T. H.,
April 17, 1905.

Editor Butchers' and Stock Growers'

Journal:

I read with much interest in your issue of the 30th ultimo the article on "Cactus-Fed Beef."

On this ranch we have one paddock of twelve hundred acres covered very thickly with cactus or prickly pear; there is also a slight growth of Bermuda grass growing. In this paddock are pastured, all the year round, four hundred head of cattle and about seven hundred hogs. The cattle only get water when it rains, this is, during the months of December and January; the other ten months they subsist entirely and solely on the fruit and young leaves of the cactus, which they help themselves to. It is a remarkable fact that during the dry months of the year



Using the Gasoline Torch to Singe the Thorns From the Wild Thorny Cactus so the Cactus Could Be Fed to Live Stock. An Expensive Process, But Practiced by Many on Account of the Food Value of the Cactus



Collecting Wild Thorny Cactus in Australia, Where It Is Fed in Quantities

we get more fat cattle per cent from that paddock than from any of the others.

I consider cattle fed on cactus like these are to have as fine flavored beef as any I have tasted in San Francisco or New Zealand.

The hogs, with the exception of a light daily ration of corn, fed to keep them tame, live exclusively on the young leaves and fruit, which are fed to them by herders, and thrive wonderfully.

L. VON TEMPSKY,
Manager Haleakala Ranch Co.

In Texas, William St. Clair, a successful cattleman, who has for years been using the wild, thorny cactus for cattle food, writes:

"We find it very poor policy to put the slightest limit on the amount our cows get. The more they can eat, the better they thrive, and the more milk they give. There is nothing that sets them back more than a shortage of cactus. If we happen to be short of milk, the cause is almost invariably traced to the lack of cactus."

H. W. Giddens of the Giddens Stock Farm, Texas, says:

"Cactus produces a good, rich, grass-colored butter, without any odor or flavors. We feed in the field, and simply singe the spines."

Actual feeding tests with a large number of stock have been held where the chief food for the stock consisted of wild cactus. It was found that under adverse conditions the gain in weight was very satisfactory and the cattle thrived exceedingly well. The cattle were handled in the same manner as the ordinary stock, and were shipped into the Eastern market, where they brought the highest prices.

Innumerable instances might be cited in addition to the foregoing which show the satisfactory results of feeding the wild, thorny cactus, aside from the disadvantages occasioned by thorns.



Luther Burbank Among His Thornless Cactus Plants at Santa Rosa

The Results of Luther Burbank's Work on the Thorny Cactus

Mr. Burbank early perceived the tremendous possibilities of a cactus without thorns developed to a commercial state and set about the task of producing such a spineless or thornless cactus. He has more than accomplished the aims he had in mind when seventeen or eighteen years ago he first conceived the idea of developing the wild, thorny cactus into a satisfactory and easily handled forage. The Burbank Spineless Cactus, considered in all its possibilities, is superior to any forage grown on the face of the earth.

The economic effect of Mr. Burbank's achievement in taking the wild, thorny cactus and turning it into a remarkable forage plant cannot be overestimated. In

summing up briefly what Mr. Burbank has accomplished may be stated:

First. The feeding of the wild, thorny cactus in itself is beyond the experimental stage, having been extensively utilized for hundreds of years in the various parts of the world as a forage, for all classes of livestock. But one thing prevented its utilization on a wider scale, namely, the thorns which were very dangerous and which inflicted injury to any animal that fed thereon.

Second. Mr. Burbank has removed this obstacle. He has produced from the wild, thorny cactus a cactus which is devoid of thorns.

Third. He has also increased the food value of the Burbank Spineless Cactus very materially.

Fourth. He has also developed enormously the productivity of the cactus, having, in fact, increased the productivity in many instances over tenfold.

Fifth. Mr. Burbank has increased the yield of fruit very greatly, and has developed the sugar content, which runs as high as 16 per cent.

These results are all achieved without special conditions of culture, care or attention.

The remarkable ability of the Burbank Spineless Cactus to thrive with very little moisture is one which makes millions of acres of heretofore unprofitable land available for the production of enormous crops of cactus forage. On these lands alfalfa and hay could not produce a crop.

The value of land is fixed by its productivity. This means, in other words, that the result obtained in the supporting or feeding of livestock from a given acre of land establishes the value of that acre. The Burbank Spineless Cactus, growing under favorable conditions, will produce enough forage without irrigation to support the year around from two to four cows per acre, a record unequalled by any other forage crop.

As the surrounding conditions become more favorable, the productivity of the cactus is increased. In other words, cac-

tus is a crop that is adapted to both cheap land and high-priced land. The better the soil and general conditions, the greater the yield.

It has many advantages over other crops, the chief one being that it is a green succulent forage for livestock **THE YEAR ROUND**. It does not have to be harvested at any particular season, and if immediate use is not contemplated, the cactus will continue to grow if left in the field. There is no need of harvesting and storing as would be the case with any other forage crop.

Spineless Cactus is something which is new, and on account of this there are very few who have had extended experience in handling or caring for the cactus, therefore it is inadvisable to accept the advice of those pretending to be informed, but whose knowledge is limited. Those who plant cactus are urged to read carefully the instructions covering the culture and the handling of the cactus as set forth in this book, which have been prepared under the general direction of Mr. Burbank, who is the creator and only recognized authority on the Burbank Spineless Cactus. Cactus is not like any other plant, therefore it cannot be handled like the average plant or as the judgment might dictate. The care and culture of cactus, while very different from the ordinary plants, yet is so simple that one following directions should have little difficulty in obtaining satisfactory results.

"That the millions of acres of desert land overgrown with cactus may be made a source of large revenue, seems almost incredible, but stranger things have happened. Unless Burbank be badly mistaken, the spineless cactus is destined to become one of the most useful of plants, furnishing abundance of food for man and beast in regions which have been regarded as too sterile and desolate for any form of stock raising or farming. And the profitable conversion of the common form of the plant into alcohol seems even better assured."—"The Sacramento (Cal.) Bee."

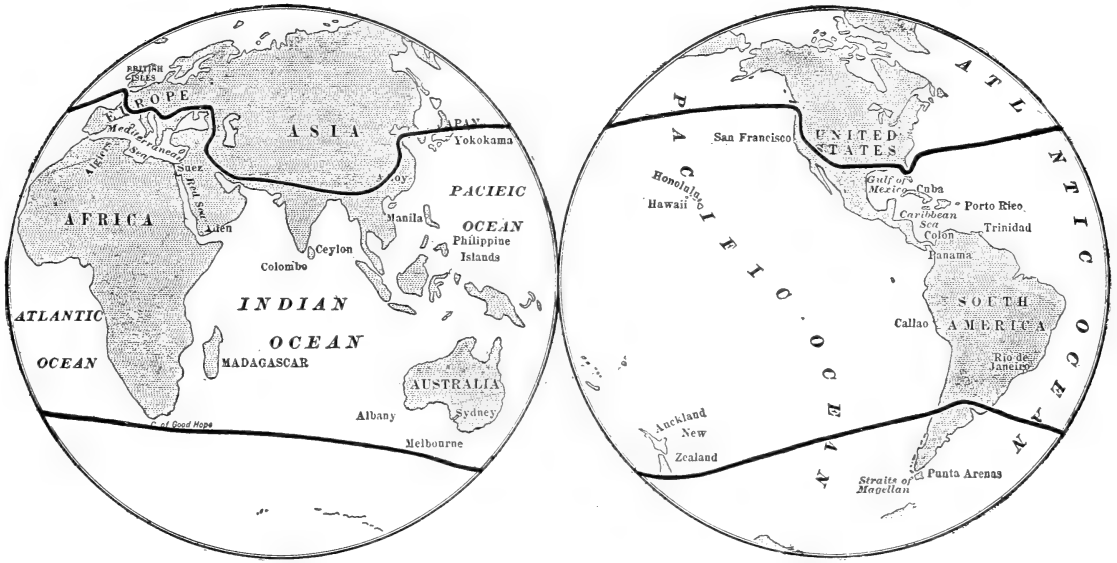
"The production of these new spineless fruiting cacti is, in my opinion, as important to the

world as the discovery of a new continent."—Judge S. F. L., San Jose, Cal.

RESTORING THE LAND

There is every prospect that before the life's work of Luther Burbank has ended he will have seen thousands of square miles of desert lands of the world trained to a profitable condition of fertility through the medium of his spineless cactus. The British government is considering the feasibility of introducing Mr. Burbank's hybrid plant in the Sahara desert, with a view of eventually forcing the most unprolific district in the world to support life.—"Register-Leader," Des Moines, Iowa.

Where Cactus Can be Successfully Grown



Map of Globe, Where Spineless Cactus Can Be Grown

Cactus can be grown close in along the coast of California, south to San Diego, in the great valleys of California, in a considerable part of Southern Arizona, Southern New Mexico, Southern Texas, Southern Louisiana and all along the Gulf and Atlantic Coast of the United States well up to South Carolina for about one hundred miles inland, more or less, according to elevation and other factors. In a general way, this is the part of the United States best adapted for cactus culture.

Maps of the Globe with cross lines indicating the northern and southern limits

for the successful cultivation of the new Giant Burbank Cactus plants for fruit and forage; it will be observed that the whole continents of Africa and Australia, most of South America and the southern part of North America, Southern Europe and Asia and most of the thousands of islands of the seas are included in the territory where they can be grown; even this great territory, including more than three-fourths of the inhabitable land of the earth is being somewhat extended by the production of hardier varieties. This work is progressing slowly but very surely.

"Burbank's thornless cactus is certainly proving itself to be the modern vegetable marvel. Nothing like it has ever been produced before. Its vitality surpasses the limit of belief, for nothing in the vegetable world has ever shown such wonderful resistant capacity, such reproductive powers, such exuberance of growth."—"Standard," Eureka, Cal.

"On one of our experimental farms, in this state, we have some of Mr. Burbank's thornless cactus growing side by side with the best varieties of the government's thornless cactus, distributed last spring.

"The rate of increase on the part of the poorest of the Burbank cactus as compared to the best of the government cactus is about fifteen to one."—"Enterprise," Silver City, N. M.

The Spineless Cactus for Forage

For all Livestock Including Poultry

The leaves or slabs of the spineless cactus are used for food for all kinds of stock including poultry. The whole plant, both the leaves and the fruit, almost without exception, finds immediate favor with all herbivorous animals.

They actually prefer it to almost any other food. More than that, it makes a superior quality of beef and exceedingly rich milk. This is not surprising as the cactus is one of the richest foods known in sodium, potash and magnesium, which are the principal salts found in milk.

These valuable organic salts are found in the cactus more abundantly than in any other food.

The fact is often observed that animals, when fed on cactus, improve in condition more than can be accounted for by the usual chemical analysis for food values. It has been a matter of much study by chemists until it was discovered by actual experiment that the organic mineral salts, known as sodium, potash and magnesia aided in the digestion of food, which was not otherwise assimilated and utilized by the animal.

"The Burbank Spineless Cactus will prove especially valuable in feeding dairy cattle, as it will furnish a succulent feed throughout the entire year, so that an even flow of milk can be obtained.



A Single Burbank Spineless Cactus Plant

"When fed with a little cotton-seed meal or other concentrated food or used with about fifteen pounds of good alfalfa hay, it will prove the ideal feed by which dairy-men may obtain the same quantity and quality of milk in January as in June.

"Even now, the best butter is being made from dairy herds fed on singed wild cactus with only three or four pounds of cotton-seed meal per day or its equivalent; while some of the best beef cattle have

been fattened on the same rations, and sheep, hogs and calves are being prepared for the market on an exclusive cactus diet."

As cattle always follow feed, there should be an ever-present market for cactus forage wherever it is grown. Besides, as the different varieties of cactus mature fruit from September to March, they enjoy a season of exceptional shipping advantages.



A Single One-Year-Old Plant Showing the Remarkable Productivity of the Burbank Spineless Cactus. Forty-four New Slabs Produced from One Original Cutting as the Result of One Year's Growth.



100 Tons of Spineless Cactus Forage Per Acre Per Year. Field Scene at Santa Rosa

The Annual Yield

In the summer of 1906 in the coast climate of Sonoma County, California, on the black heavy adobe, a soil thought wholly unsuitable for cactus, there was produced an average of forty-seven and one-half pounds per plant in six months' growth, from single rooted leaves. These yielded 180,230 pounds or over ninety tons of forage per acre.

One may reasonably expect, under favorable conditions, to obtain a yield up to 100 tons of good forage per acre per year.

The Spineless Opuntias will produce nearly double as much feed the third and succeeding years as they do the second season of planting.

Of course, it would not be expected that there would be more than one-fourth of the above yield on desert soil without irrigation. Still there could be expected almost twice as much, as mentioned above, where the climate is warm and where there are one or two light irrigations each season.

Of Easy Culture and Rapid Growth

Burbank's Spineless Cactus Always Grown from Cuttings, Never by Seeds

Everybody knows that Baldwin apples, Bartlett pears and our favorite peaches, plums and cherries can not be raised from seeds; just the same laws hold true with the improved Opuntias, but fortunately they can be raised from cuttings in any quantity with the utmost ease—more truly they raise themselves, for when broken from the parent plant, the cuttings attend to rooting without further attention, whether planted right end up, bottom up, sideways or not at all.

Best results are generally secured by planting the lower half of the cuttings below the surface of well-prepared, dry, warm soil or sand.

No form of plant life perhaps responds more readily to kindly treatment than the Opuntia. This is demonstrated in the faster, heavier and generally better growth possible through a moderate amount of cultivation, the keeping down of grass and weeds, during the earlier periods of growth. Larger yields of finer fruit and more and tenderer pads are the

result of proper treatment. It is but natural that under distressing conditions, due to the lack of proper care, some varieties, especially fruiting varieties, may develop a few short spines on the edge of a slab or rarely one here and there, but these generally will be found, if at all, to be soft and cottony and so insignificant as to be harmless. What spines do appear as a general thing will drop off as the plant grows older.

People who are not acquainted with the cactus often mistake the numerous pointed leaflets on the undeveloped slabs for spines. These, having no function to perform, soon drop off. They are as different from spines as blossoms are from leaves.

The leaves of these new Giant cactus varieties should be shrunken slightly or wilted at least (except in absolutely dry deserts or in very warm summer weather). Meantime, an earlier and more rapid growth will be secured by plowing and harrowing the land as for any other crop.

Comparative Value of Cactus Forage

There is not any particular price for cactus forage, simply because there is not any for sale. And yet the question is often asked, what it is worth? The best answer that we can give is that where

one acre of land will produce enough feed for one cow, the cactus plant will grow enough feed for four. In other words, it is four times the feeding value in quantity and quality of alfalfa.

Is man also to redeem the desert for civilization? The French will test Burbank's spineless cactus on Sahara and the desert islands of Mayotte, off Madagascar, and the English and Germans will try its virtues in their South African possessions. Burbank's creation is declared to be palatable not only to cattle, but to

man, and it thrives on areas that are hopelessly arid, provided there be plenty of heat and light. It would be an almost crowning achievement if, by his genius, man, after these thousands of years were able to announce the doom of the desert.—"Journal," Portland, Ore.



FEEDING HOGS BURBANK SPINELESS CACTUS

These Hogs Gained Three-quarters of a Pound Each a Day. The Result of the Feeding Is Shown by the Following Affidavit.

RESULT OF FEEDING CACTUS TO EIGHT HOGS, AT SANTA ROSA, UNDER THE SUPERVISION OF THE SANTA ROSA CHAMBER OF COMMERCE

May 30, 1913, to June 22, 1913

AFFIDAVIT

This test was conducted near Santa Rosa, California, under the general supervision of representatives of the Santa Rosa Chamber of Commerce.

There were eight pigs in all, divided into two pens. These pigs were of no special breed, being common stock taken from hill pasture, where their main foods were green grasses, roots and whatever is usually found by pastured hogs, the hogs being more or less wild. The test would have shown better results had thoroughbred hogs been chosen.

Pigs ranged from 35 to 80 pounds in weight. In one pen cactus was fed exclusively, and in the other cactus with a very small amount

of rolled barley and bran. The cactus used was taken from Mr. Burbank's experimental farm, being old stock which had been discarded. From the first, the pigs ate cactus readily. In the beginning it was thought necessary to supply all the water the pigs would drink, but it became apparent that very little water was necessary, and was almost entirely discontinued, with more beneficial results. From 20 to 30 pounds of cactus were fed each day to each pen. The pigs ate up all that was offered them, care being taken not to feed too much. Enough cactus was cut from the field to last several days, and was cut up in small portions by running it through a slicer just before feeding time.

NET INCREASE IN WEIGHTS OF HOGS

Pen No. 1			
	May 30, 1913	June 22, 1913	Net Gain
4 hogs	195½ pounds	257 pounds	61½ pounds
Pen No. 2			
4 hogs	274½ pounds	331 pounds	56½ pounds
Total	470 pounds	588 pounds	118 pounds

Twenty-two days' net gain for eight hogs was 118 pounds.

The net gain per hog for 22 days was 14 2-3 pounds, an average of two-thirds pound per day.

Condition of pigs good, and in every way showed proof that cactus makes an excellent and satisfactory green fodder, the cactus supplying a good succulent ration for growing hogs.

During tests of pigs, a thoroughbred Berkshire sow, with four suckling pigs, was put upon a diet of cactus and rolled barley. Through lack of a proper supply of milk this sow had lost several of her litter, and the remaining four were in poor condition. The sow responded quickly to the cactus feed, giving a decided increase in flow of milk, the result of which was shown in the rapid growth and good condition of the suckling pigs. The small pigs soon learned to like cactus and ate it greedily.

The foregoing statements and facts are true to the best of my knowledge and belief.

JOHN RINNER, President,
Santa Rosa Chamber of Commerce

EDWARD H. BROWN, Secretary,
Santa Rosa Chamber of Commerce

Subscribed in my presence, this 22nd day of June, 1913.

[Seal]

CHARLES M. KELLOGG,
Notary Public, in and for Sonoma County, California.

A Demonstration of the Superiority of Cactus as a feed for Cows and Hogs

Result of Feeding Burbank Spineless Cactus at the Certified Dairy
Owned by H. R. Timm at Dixon, California

Affidavit

As Feed For Dairy Cows

	Milk Lbs.	Cactus Lbs.
September 2, 1912	37	10
September 3, 1912	36	22
September 4, 1912	34½	38
September 5, 1912	37½	67
September 6, 1912	42	75
September 7, 1912	44	75
September 8, 1912	45	72
September 9, 1912	47	76
September 10, 1912	46	74
September 11, 1912	45½	76
September 12, 1912	43½	80

The above is the result of a test in the feeding of Burbank Spineless Cactus to a dairy cow, made at the H. R. Timm Dairy, Dixon, Cal. The test was made during a period of ten days to find out the real value of cactus as a milk-producing food.

As the dairy herd was being fed on the best kind of green alfalfa and alfalfa hay, it would hardly be expected that a cow would increase in milk when cactus was substituted for the green feed. On September 2, the cow was taken from the herd and placed on a ration of cactus and barley, and a light feed of alfalfa hay. Within four or five days she ate it without any grain and soon reached a gain of ten pounds of milk daily.

AS FEED FOR HOGS

On September 13, 1912, two three months' old pigs, weighing together 190 pounds, were given a feed of Burbank Spineless Cactus.

The slabs in the beginning were fed to

the pigs whole and were torn to pieces and greedily eaten by them.

On the evening of September 21st the pigs weighed together 210 pounds, showing a net gain of ten pounds each over a period of eight days. During this period they received in addition to the cactus possibly five pounds of alfalfa, but nothing else.

The physical condition of the pigs at the end of the test was excellent, being the same as when pastured on alfalfa.

I consider it a splendid substitute for green alfalfa when fed with a small amount of alfalfa hay. And I consider it doubly valuable as a cow food on account of the fact that it can be harvested and fed during the winter months when there is no other green feed.

H. R. TIMM.

State of California,

County of Solano—ss.

H. R. Timm, being first duly sworn, deposes and says: I have read the attached statement of facts and know the contents thereof, and desire to state that the same are true to my own knowledge, information and belief.

Subscribed to and sworn to before me this 3rd day of December, 1912.

H. R. TIMM.

WINFIELD R. MADDEN, Notary Public in and for Solano County, California.

NOTE : Mr. Timm is the president of the First National Bank of Dixon and the owner of one of the largest and best certified dairies in the West.

The Burbank Spineless Cactus Supplies all the Water the Animals Need

There is the further consideration that the cactus supplies the animal with almost all the water it needs.

In Hawaii and Mexico, cattle have been known to subsist for six months on a cactus diet without a drop of water.

The following letter from Robt. Hind tells of his 20 years' experience in feeding cactus without water:

PUUWAAWAA RANCH

Kamuela, Hawaii, May 17, 1913.

The Luther Burbank Company,

Exposition Building, San Francisco, Calif.

Gentlemen: I am very happy to conform to your request for a statement from me regarding my experience with the feeding of the wild thorny cactus upon my ranches in the Island of Hawaii, during the past twenty years.

First of all, I wish to emphasize that all my cactus-feeding experience has been with the wild thorny cactus, the old-fashioned spiny variety, and not with the Spineless Cactus. This variety thrives on my ranches on the poorest soils. I am told that it is a native Hawaiian plant, or was introduced there very many years ago. The only difference between this cactus and the Burbank Spineless Cactus is the absence of the spines on the latter.

Cattle on my ranch have been fed on the thorny cactus for as long a period as fifteen years, and have thrived on such feeding. I have had to depend upon my cactus patches almost entirely for stock feed during the dry seasons, and I have found it to be unexcelled for this purpose. The very best results are obtained when cactus is mixed with a small quantity of dry feed, such as dry grasses, old hay, etc., but this is not absolutely necessary. While using my cactus chiefly as a reserve for the major portion of my herd, I find even when I have a fair amount of other feed I could add spiny cactus to it, and the cattle did better than if they had other feed without the cactus. I do not raise any other form of green food.

Perhaps the most peculiar and significant fact concerning cactus as stock food is that it supplies all the water the animals need. Horses and livestock on my ranch, fed with spiny cactus, thrive wonderfully without any water whatever. I have good fat cattle that have never seen water, and do not know how to drink it when offered to them. I have other cattle which I have imported from the United States, and which have not tasted a drop of water since being fed on the cactus. They have lived for years without water, and are as fat as any grass-fed cattle in the United States. They make just as good beef as you can get in any restaurant. As a

matter of fact, some of my ranges are absolutely devoid of springs and water, yet the cattle go year after year thoroughly content with the cactus food, from which they receive sufficient water to supply all their physical needs.

My hogs always thrive better on a cactus feed than when they are fed on dry feed with water. The general physical condition of the stock is most excellent. Some of my cattle feed on the cactus the year round, the number being governed by the available supply. But not only is the cactus a much sought after food by the hogs and cattle. I have about 1000 turkeys which subsist chiefly on cactus slabs and the fruit which the cactus bears in considerable quantities. These turkeys do not get a drop of water.

I have lost quite a few head of cattle, due to the spines, but the number is not very great in comparison to the number of cattle that feed upon it.

I find that cactus is a splendid milk producer. There is something in the cactus that seems to help the flow of milk. What it is I do not know, but I do know that it has a positive beneficial effect, other than the mere food value.

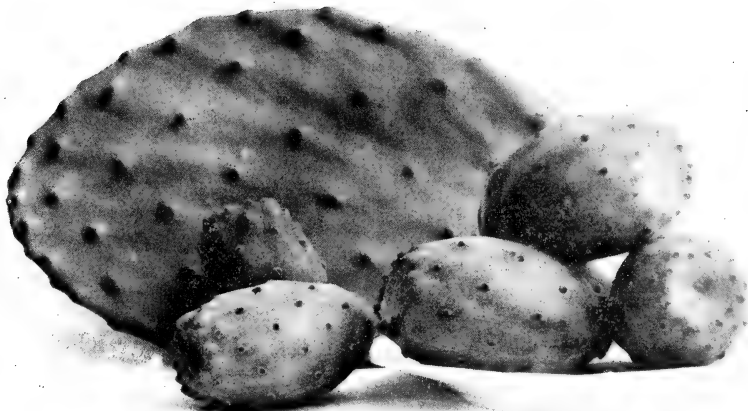
My own experience with the spiny cactus led me to investigate the Burbank Spineless Cactus, and it is my opinion that the Burbank Spineless Cactus is very much superior. I planted some three years ago a number of plants of the Spineless Cactus obtained from Mr. Burbank, and they have thrived remarkably well, but I have preferred to conserve these plants for future use, and to extend my acreage. As you know, I have just purchased a very large quantity of the Burbank Spineless Cactus, and I look to this to furnish me with the means of practically doubling the amount of livestock on my ranges and to furnish them with a forage which is unexcelled. Another advantage in the cactus forage is that you do not have to harvest at any particular season, and if you so desire the growth may accumulate year after year until actually needed.

I should much prefer to feed cactus every day in the year, allowing the cattle to have all they care to eat, but, as I said before, my great concern is that my supply is limited. I consider cactus one of the very best forages for semi-arid or dry countries.

Yours very truly,

(Signed) ROBT. HIND.

Note.—Mr. Robert Hind is one of the largest and most successful ranchers in the Hawaiian Islands, controlling over 50,000 acres of land. He has been engaged in raising livestock for over twenty years and has several thousand head of cattle, several thousand sheep and hogs and a large number of horses. He is progressive and believes in blooded stock and has from time to time imported the finest types of Herefords and Polled Angus cattle.



Burbank Cactus Leaf and Fruit

The New Burbank Cactus for Fruit

The old thorny varieties of the fruiting cactus are too well known to need description. The fruits are the principal food for millions of people during three or four months each year. The fruits of the Burbank Fruiting Cactus are greatly superior to the old kinds, and can be raised for one-tenth the cost of producing other fruits.

The fresh fruit of these improved varieties is unique in form and color, exceedingly handsome, unusually wholesome (the large amount of vegetable salts they contain being regarded as very beneficial), and far superior to the banana in flavor. There is never a failure in the crop, which can be shipped as safely as the other deciduous fruits. The fruit can be gathered and stored like apples, and some kinds will keep in excellent condition from four to five months. Samples packed in ordinary packing boxes without ice, were shipped to Chicago, New York, Boston and Washington and kept in perfect condition.

Most delicious jams, jellies, syrups, etc., in enormous quantities, at a nominal cost, are made from the fruits alone or in combination with other fruits, besides various foods and confections, such as Tuna honey (Miel de Tuna), Tuna butter (Melcocha), and Tuna cheese (Queso).

Opuntias have been used (even the thorny ones), for making confectionery by the Mexicans and others for a long time. Some of the finest candies of Mexico are candied cacti of various forms.

The juice from the fruits of the crimson varieties is used for coloring ices, jelly and confectionery; no more beautiful colors can be imagined.

For the old fruiting, Opuntias or Prickly Pears, eighteen thousand pounds of fruit per acre is found to be a common crop on the poorest soils, while on good soils the best Burbank fruiting varieties will and have produced at the rate of more than one hundred thousand pounds of delicious fruit per acre. The fruits differ in various ways like apples, plums or peaches. By



Burbank Cactus in Fruit

analysis they are found to contain from six to fourteen per cent sugar, besides a small amount of protein and fat, also aromas and flavors. Some contain more of these, some less; all desirable qualities are greatly increased by scientific breeding and selection for this purpose, as with the apple, peach, sugar beet and other fruits, grains and vegetables.

Some of the earlier varieties ripen in June and July, the later ones in August, September, October and November and through the winter. Most of them com-

mence bearing about the third year from cuttings.

The general practice to prepare the fruit for use is by brushing with a whisk broom or rubbing with a coarse cloth, then cutting a thin slice from each end through the skin, then slitting from end to end when the skin may be readily removed, leaving the solid, sweet flesh ready for use; another way is to slice through the center of the fruit from end to end and remove the flesh with a spoon.

"It can be safely said without fear of con-head of all forage plants as a stock and dairy tradition that the prophecies of Luther Burbank feed in our Western arid and semi-arid States, regarding spineless cactus are being fully realized as well as poultry feed and a luscious fruit for ed—and that it is now taking its place at the our tables, second to none."

The Kind of Climate and Land Needed for Cactus Culture

Climate

Cactus will not thrive where the ground freezes over an inch in depth or where the temperature stands as low as fifteen degrees above zero for any great period. Extreme heat is not of serious consequence.

About six to eight inches of rainfall are required for the best cactus culture, although cactus will do well on three to five inches per season.

It is not necessary that the rainfall

should be regular. The precipitation of rain can be once in four years or even as infrequent as once in ten years.

The Kind of Land

Cactus plants do not necessarily require rich land. The climate conditions are more important than the soil.

The land need not be what is generally denominated fruit or agricultural land.

Cactus will stand as much white alkali as any plant which grows.



Newly Planted Cuttings Showing the New Growth. Fifteen New Slabs on One Plant

How to grow the Burbank Spineless Cactus

Full Cultural Directions

WHAT TO PLANT—CUTTINGS OR SEEDS

Cactus should always be raised from cuttings, never under any circumstances from seed, as it always runs back to the thorny kind when grown from seed, but never when grown from cuttings. It has been proved time and time again in thousands and thousands of cases that the new spineless cactus does not run back to the thorny state any more than a Baldwin apple can change to a Ben Davis or a Bartlett pear to a wild pear.

WHERE TO PLANT

These new spineless cacti can be planted in any part of the earth where the thermometer does not go lower than 15 degrees above zero and where the rainfall is not over 40 or 60 inches. In localities where the rainfall is continuous and heavy the cactus sometimes suffers from decay of the leaves. It is not in any way particular as to soil, growing in any soil in which any other plant will grow if it is not too wet. Good agricultural land, like corn land or vineyard land, is especially good, and will, of course, produce a larger crop than poorer land. Temperature and moisture are the two important matters to look after; soil is of little consequence compared with these.

WHEN TO PLANT

Cactus should never be planted, transplanted or moved during rainy winter weather, which is just the time to plant nearly all other trees and plants. If planted at this season they very promptly decay, especially if it happens to be cold at the same time that it is damp. The two together are death to the cactus when moved at such seasons and under such conditions. The best months for planting are the warm dry months extending in Central California from April to November. The actual seasonal conditions govern always. Planting after November is satisfactory when there is little rainfall, and much sunshine and the land is dry.

HOW TO PLANT

The cuttings consist of slabs, sometimes called leaves. These weigh from two to five pounds, according to variety. It is always best to plant a whole slab. While those that are divided will sometimes grow fairly well, it is not economy to divide them. Better results are always obtained by planting whole slabs. As before stated, this must be done during the warm months. Every slab, if properly

CACTUS ERA INEVITABLE

"The cactus area is just opening. Ten or twenty years hence, many well-informed men believe the cactus will have supplanted and displaced alfalfa throughout a great area of the civilized world. Why? Because the cactus will grow with little or no irrigation, upon any kind of soil, with infinitely less attention than alfalfa must have, and will produce far greater results in yield of fodder.

"The romance and marvel of the Burbank Cactus would fill a large book. The story of the sixteen years of patient effort employed by that wonder-worker, Luther Burbank, justly calls for a place in literature.

"Imagine, if you please, a man collecting the cacti of the world, selecting from all of these varieties the best, then growing millions of seedlings, crossing and recrossing them, selecting and reselecting and, finally, after sixteen years tri-

umphantly evolving from this patient, laborious process and from millions of discarded cacti, seven plants which were not only free from spines, but which possessed the growing and feeding values for which he had so long striven. This, in a nutshell, is what Luther Burbank did with the cactus. Sometimes out of 100,000 seedlings he destroyed 99,999. The remaining individual he watched and tended as carefully as a mother her nursing babe. Patience, infinite patience, had to be added to the Burbank genius, the truly Spineless Cactus.

"Of those anxious ones who have endeavored to detract from the merit of this, the greatest of the Burbank triumphs, we will say nothing. The Burbank Thornless Cactus speaks for itself. It will, by its wonder-working accomplishments, best answer all critics, whether malicious or ignorant."—Ex.

planted and not irrigated, will root in from four to six weeks, promptly, surely and without fail, if properly treated. Unlike all other plants, it is best that the cuttings should be wilted a little, though in hot weather they will grow without wilting. They can be wilted in any ordinary warm climate if placed flat on the ground where the sun does not strike them from 11 to 2, or any little shade which protects them from the burning, fiery heat of the mid-day sun. When the parts that have been cut in removing from the old plant have become dry and seared over, they may be planted at once, one-third under the ground and two-thirds above, either straight up or slanting at any angle. This is absolutely all that is necessary in planting cactus. If the cuttings happen to be a little bruised in shipping, the bruised places should be cut away and during the summer time will heal over at once. In the winter time such bruised places will promptly decay.

PREPARING THE GROUND

Any kind of soil will do for the cactus, though as with all other plants, the better it is the better they will grow. The ground should be plowed and harrowed and allowed to become quite dry on the surface before the cuttings are planted. In planting the cutting, it is well to dig out all moist earth with a trowel or spade, and to have dry dirt around the lower part of the cuttings, as they root much quicker in dry dirt than in moist, strange as it may appear. Many failures of cactus cuttings have been caused by planting in too damp soil, or irrigating too soon after they are planted. In planting for forage it is well to make double rows three feet apart, and these double rows should be about ten or twelve feet apart and in these double rows the cactus should be planted alternately, as in this way they help to hold each other up better and have more room to grow, especially while young. Cactus may be planted on hillsides in very hot climates on the north sides. They thrive best on the south sides in cold climates. The cactus is especially valuable as an adjunct to alfalfa, as it will grow on ordinary land with a very small amount of water, where alfalfa would be sure to die out. Under such conditions, the cactus

will thrive where alfalfa cannot be grown. Nothing can be superior to the cactus for this purpose, as it improves year by year. Cactus should never be planted in the shade or wet land. In some cases, where there is an extreme cold spell of weather the tips of the leaves will sometimes freeze. When thus frozen all the decayed parts should be cut away as soon as possible, and as soon as a sunny day comes the plants will heal over and no further damage will be done, while if the decayed portions are left on the plants a part or the whole plant may sooner or later be involved with the decay.

COST OF SETTING OUT SPINELESS CACTUS

In Europe cactus has been set out by hand labor, and the cost is estimated to be about \$5.00 per acre.

One man can set out 1000 slabs a day in ground previously well prepared. In a country where traction engines can be used and large tracts set out, the cost would not exceed \$5.00 per acre.

CULTIVATION

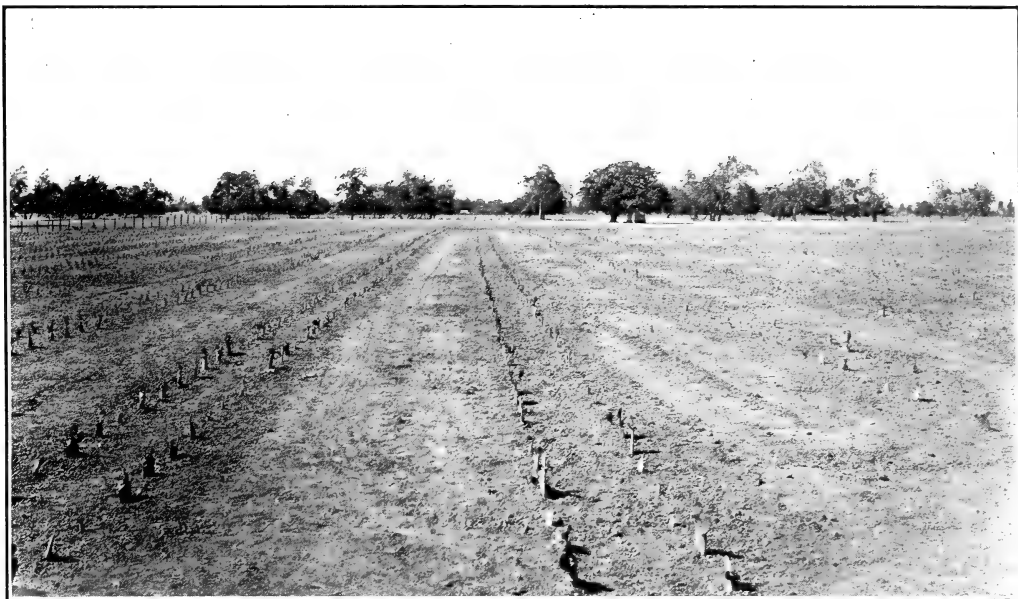
Cultivation during the first season or two is of advantage to cactus, especially on dry ground. Irrigation is barely permissible after they get a good start, but not until they are well rooted. Cactus will thrive with one tenth the water which alfalfa requires.

WHEN TO HARVEST

One of the principal features of the cactus is that they can be allowed to grow year after year until needed in a dry season, or in case of a shortage of feed, then can be harvested by the wholesale. On good land more tons of it can be obtained per acre than on five to ten acres of other forage. In harvesting for ordinary, regular feeding, it is well to cut off the top and side leaves with a long knife, hatchet or other tool, and feed to the stock as needed. It may be fed at any season of the year without regard to season—summer or winter, spring or fall.

YIELD

The yield of the cactus depends greatly upon the variety. The common wild cactus yield all the way from five to twenty tons per acre the third year. Some of the new ones will yield ten or even more times



SHOWING METHOD OF PLANTING CACTUS

Double Rows—Twelve Feet Apart, With Cuttings Spaced in Three-Foot Squares in the Double Rows. By This Method a Wagon Will Reach Four Single Rows in Gathering the Cactus for Feed.

as much. The first season, if cuttings are set out early in the season, say June, each should make, according to variety, five to ten or fifteen new cuttings. The second season twice as many as that, and the third season three times as many. The cuttings may be replanted as soon as they are hard and thoroughly ripened.

HOW TO FEED TO LIVE STOCK

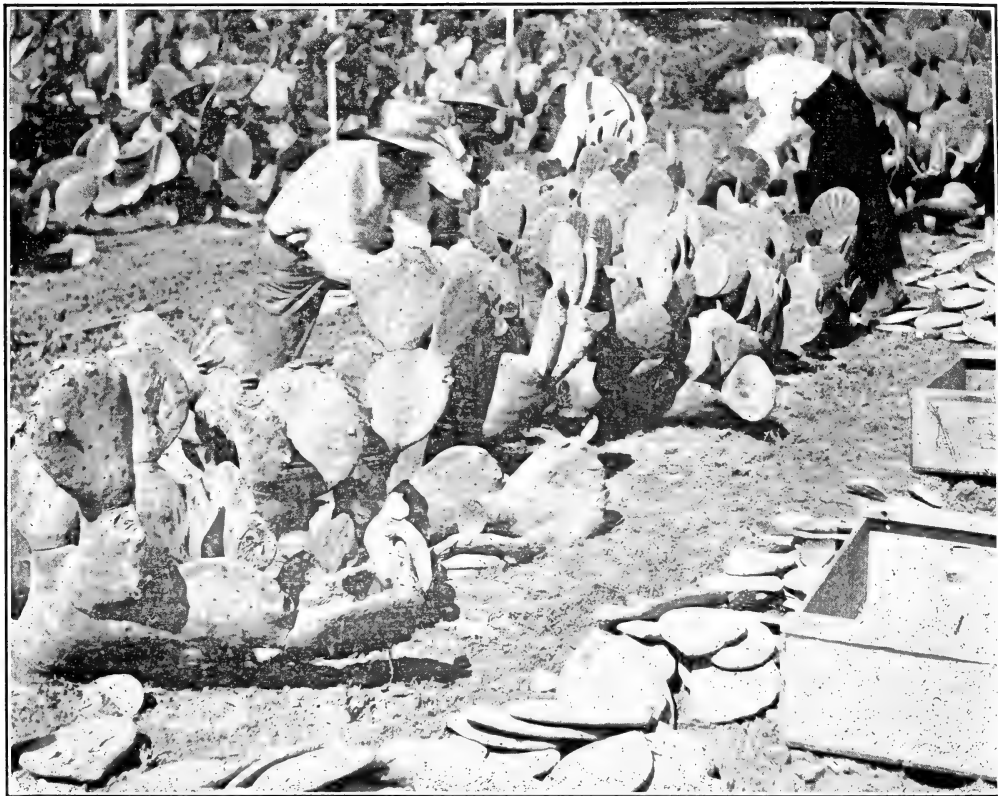
Cattle or any kind of horned stock are especially fond of the cactus, but as with all other new feeds, some refuse at first, but soon learn to eat it greedily. It is best fed to them either whole, or better still, the slabs may be rapidly run through a cutter and a little bran or sprinkling of meal will induce those animals to eat it that do not at first understand it. Poultry are also fond of it and will eat it at once, if it is sprinkled as for stock, and afterwards greedily for green feed. Hogs invariably like it when used to it. It is

particularly valuable for growing animals and for milch cows, as it increases the quantity and improves the flavor of milk at once. But cactus, like almost all other food, requires other food with it. It is quite succulent and moist, and some dry alfalfa or other hay is excellent, or a little oil meal, bran or even dry weeds. It has the same effect on cattle or growing animals as green feed of any kind, but does not bloat animals like alfalfa.

HARVEST

There is no occasion to harvest the cactus beforehand, because it is always in good condition. There is no occasion for storing it, because it is always good from January 1st to December 31st.

Like all other crops that are worth cultivating it should be fenced. No crop worth growing can be grown otherwise. If it is good, animals soon find it out, as they will every other crop that is raised for them. They should never



HARVESTING CACTUS

The Crop Has Been Cut From Plants in Foreground, Which Will Immediately Start a New Growth, Crop After Crop Thus Being Produced Indefinitely From the Original Plant.

be turned loose in the cactus patch; no one would turn stock into a beet or pumpkin patch, as they would injure the plants. They would also injure cactus plants, for they would greedily eat their tops, stems, roots and branches.

FRUITING CACTUS

Fruiting cactus is planted just the same as forage cactus, except that it should be planted a little wider apart, as they grow to an enormous size and live to a great age, and it is well to keep them pruned low. They will spread so that if planted three feet apart in the narrow rows and twelve feet apart in the wide rows they can be harvested most conveniently. The fruit is at its best during September, October and November, though some va-

rieties continue to bear throughout the winter and spring, in fact, throughout the entire year.

HOW TO PREPARE AND EAT THE FRUIT

Do not handle with the bare hands. Take each fruit on a fork and with a sharp knife cut off both ends, and, still holding the fruit by the fork, cut through the peel avoiding the little bundles of bristles; then with the knife push the peel from the oval-shaped mass of pulp within. Cactus fruit is very wholesome and nourishing and can be eaten in great quantities with benefit. The seeds are to be swallowed as with tomatoes. The fruit is much more delicious when cold.

House of Representatives, United States
Part of Cong. Record

LUTHER BURBANK AND HIS WORK

From the Speech of
Hon. Everis A. Hayes
of California
In the House of Representatives

SPINELESS CACTUS

No more important thing has recently occurred in agriculture than the successful production of the rapid-growing, edible spineless cactus by Luther Burbank. After sixteen years of expensive and costly experimentation he has produced a new and most valuable cattle food for the world. Mr. Burbank does not claim to have discovered the spineless cactus. Some varieties of this plant have been known for years, but without exception they have been non-edible by any animal. For many years it has been the custom in Africa, as well as in those parts of America where it abounds, to feed to cattle certain varieties of the prickly pear cactus after the spines have been burned off. This burning, of course, greatly increases the cost of fodder. The food value of this spiney cactus for stock has been known by cattlemen, who have grown and used it for some years.

Mr. William Sinclair, a successful cattle grower of Texas, writes:

"We find it very poor policy to put the slightest limit on the amount of cactus our cows get. The more they can eat the better they thrive and the more milk they give. There is nothing that sets them back more than a shortage of cactus. If we happen to be short of milk the cause is almost invariably traced to the shortage of cactus."

The following table shows the comparative value of the average cacti, alfalfa, hay and gamma, a typical range grass, according to analyses made by the University of Arizona agricultural experimental station:

	In Water-Free Substance		
	Cactus without fruit	Alfalfa hay	Gamma grass
Ash	19.91	5.67	15.11
Protein	6.48	12.74	6.99
Fiber	10.22	39.04	30.31
Nitro free extract..	61.48	41.06	45.63
Ether	1.83	1.49	1.96

The great desirability of the rapid growing and edible spineless cactus for cattle food has been recognized all over the world. Inspired by the work of Mr. Burbank and by the experiments made by the French Government in Algiers, the United States, through the Department of Agri-

culture, was several years ago moved to take up the matter of securing spineless cactus. Experts were sent to foreign countries, and the world was searched that a cactus might be found spineless, or nearly spineless, which would have sufficient nutriment to be valuable as a cattle fodder. From the plants so collected the Department of Agriculture has been able to produce a cactus sufficiently free from spines and nutritive enough to be of some value for the cattle business. But today, in spite of all its organization and its wealth, the Department of Agriculture has not obtained a cactus that is in any respect the equal of the cactus produced by Mr. Burbank single-handed.

Of all stock food, the Burbank improved spineless cactus is by far the most prolific.

It is adapted to almost any soil where the temperature does not go below 18 degrees above zero, and it will stand a great amount of heat.

Cactus is the only fodder that furnishes green, succulent feed all the year.

Another source of great value in the Burbank improved spineless cactus is its fruit. It is a fall and winter fruit of attractive colors—crimson, scarlet, yellow, white and variegated. It is a sure bearer; a good packer and shipper; very healthful, and of a flavor which many prefer to that of bananas or figs. It contains 8 per cent to 16 per cent of sugar; is a great fatterer for hogs and cattle. Poultry also is extremely fond of it.

These make fine jellies, jams and glace fruits, and can be used for coloring ices, jellies, confectionery, and so forth.

In an experimental way, from the Burbank improved spineless cactus, rarer rub and wood alcohol have been produced. But the greatest value of Burbank improved spineless cactus will be that it will make highly productive and valuable vast tracts of land now barren because of insufficient rainfall, not only in Southern California and Arizona, the natural home of the cactus, but also in South America, Australia, India, Egypt and elsewhere.

For example, on the west side of the San Joaquin Valley are large tracts of land practically bare and worth but \$10 or \$15 per acre. The annual rainfall is about five or six inches—making the land semi-arid. On this soil, without irrigation, is produced enough, with a few pounds of chopped straw, bran or other roughage, to keep four cows per acre all the year. This same land, when so situated that it can be irrigated and planted to alfalfa, keeps about one cow per acre annually and is now selling for \$200 per acre. In other words, Burbank improved spineless cactus will give \$15-an-acre land a greater earning power than alfalfa on \$200-an-acre land.

Alexandria, Egypt, April 23, 1908.

"Please be kind enough to send us offer for one or more varieties of plants and the amount of money we will have to send to you for post-

ing a lot of leaves to Egypt.

"His highness, the Khedive, is keenly interested in the question of your Opuntias and will be glad to see a success of our future experiments."—Charles Chevalier de Blumencron.

Special Information

The best of these improved Spineless Opuntias when grown under favorable conditions on good soil in a warm climate may confidently be expected to produce an average of nearly or quite fifty to one hundred tons of feed per acre when once established, each season.

So much has been written about the spineless cactus and so many are deceived with the old cheap, half-wild varieties which are so often offered as "Burbank's" or "just as good as Burbank's" that it seems necessary to have them distributed direct from the originator and under correct descriptions so as to avoid as much as possible any misunderstandings, exaggerations or misstatements such as heretofore have been carelessly, ignorantly or willfully made. Utterly spurious "Burbank's Thornless Cactus" has been offered for sale by dishonest parties for six years or more, not only in America, but also in Europe, Africa and Australia.

In producing these new Opuntias more than seventeen years and much thought, labor and capital have been expended, thousands of crosses have been made, and many hundred thousand seedlings and crossbred seedlings raised. The finished product is receiving a royal welcome everywhere by those who know.

Few of the cacti are of any economic value except the Opuntias; of these there are more than one hundred and fifty species and innumerable varieties; all probably originally natives of the Western Hemisphere and were cultivated by the Indians long before Columbus discovered America. No class of plants are more easily grown, soil is not of much importance and cultivation almost unnecessary.

These new varieties are wholly distinct and the only really thornless ones known on earth that are of any practical value as producers of feed.

Stock can be turned loose among the cactus, after the plants have reached an age of three years, as the main stem becomes woody and can not be injured. On the removal of the stock from the cactus plant pasture, new leaves or slabs rapidly appear, and in a short time has as much feed as it had originally.

The cactus yields big, luscious slabs, weighing from one to seven pounds each, which can be cut at any time, summer or winter. There is no particular harvest season, therefore, no necessity to harvest and store.

The selection of ordinary Opuntia cuttings is of some importance. Those who have grown them on the shores of the Mediterranean for hundreds of years always select "bearing wood" if fruit is the object, and the least thorny and bristly leaves if a plantation is to be produced for forage; even some of the partially spiny ones may be made less so by careful selection of cuttings, but this labor is wholly useless since the new Burbank varieties are offered.

When alfalfa was generally introduced about twenty years ago, many wisecracks declared it was "no feed for milch cows." Who says it is not good for them now?

It has been proved that the poorest of the Burbank spineless cactus varieties are so far superior to any of the old half thorny ones that no comparison with them can fairly be made. Is it then surprising that practically all the nations of the earth are anxious to obtain the new Burbank Cactus as soon as possible? Be very careful, however, that you get the Burbank cactus, not the half spineless ones so very often sold as the "Burbank" or "just as good as the Burbank," such as the builders of the pyramids of Egypt may have cultivated.

BURBANK'S THORNLESS CACTUS AT KIAMUKI

"Burbank's thornless cactus is now being cultivated at Kiamuki, and plants are being taken from there and sent to the other islands. This new form of cactus is growing well and there are hopes that it will grow rapidly on the other islands, especially in the cattle districts.

"As a food product the cactus appeals to cattle as one of the most attractive foods found in the pasture lands. Even the thorny cactus is eaten by them."—"Commercial Advertiser," Honolulu, T. H.

International Headquarters Salvation Army
Service, London, E. C.

"I am so glad to know that you will so kindly supply us with your latest varieties of absolutely spineless cactus, as I am sure this will be most valuable to India. Next to human beings the cattle in India suffer terribly at the time of famine and scarcity; in fact, during two or three months every year they are reduced to the point of starvation during the extremely hot weather, wandering about in search of food. Hence, I feel sure your cactus will be a great boon to them, for cactus, as you know, grows freely in all parts of India, only it is of the thorny kind.

"Wishing you every success in your work, believe me,

"Yours very sincerely,
"F. BOOTH TUCKER."

Imperial Russian Consulate,
San Francisco, Cal.

Luther Burbank, Esq., Santa Rosa, Cal.

Dear Sir: It is generally known that scientific societies, both public and private, as well as the world at large, are greatly interested in your work of research. Lately the Imperial Russian Department of Agriculture has turned its attention to your cultivation of the thornless cactus.

I have the honor to be,

Yours truly,

K.

THAT SPINELESS CACTUS IS A SUCCESS HAS BEEN PROVEN AT YUMA

The growing of spineless cactus is no longer a desert dream, or the figment of the imagination. This desert wonder is being grown in the desert lands adjacent to Yuma and some surprisingly good results are being obtained.—"Times," Bouse, Ariz.

"That the Chamber of Commerce of the city of San Diego does most heartily endorse the efforts to spread the new Burbank fodder, thornless cactus, throughout the Southwest, thereby rendering highly productive vast areas of arid and semi-arid lands, and thus still further demonstrating the agricultural importance of this section of the country."—Resolution adopted by San Diego Chamber of Commerce.

SAMPLES OF VARIOUS COMMENTS ON THE WORK

"Mr. Burbank's first publication on economic cacti serves to set at rest many groundless sup-

positions as to the character of the work he has had under way for years on these plants. Some persons, forgetting that Mr. Burbank has made up to now no official announcement of his work, jumped to the conclusion that he had merely hit upon one of the common nearly spineless forms of *Opuntia Ficus Indica*. Others more dishonest have been offering for sale so-called 'Burbank's Thornless Cactus,' despite the fact that not a single plant or seed of Mr. Burbank's new creations has left his grounds up to a few weeks ago.

"Mr. Burbank was perfectly well aware of the inception of his work on the opuntias that there were many forms nearly thornless, and he has even brought to light one kind, which he calls the 'Marin,' grown in many countries, that has neither spines nor spicules. The Marin is not of much value, however, as it is a rather small plant and is not hardy. The new forms are much more rapid growers and are also more hardy."—Dr. Walter T. Swingle, U. S. Department of Agriculture, Washington, D. C.

Consulado General de Mexico,
San Francisco, Cal.

Hon. Luther Burbank,
Santa Rosa, Cal.

Honored Sir.—I beg to offer you my profound acknowledgments for your kindest authorization to have your announcement of the spineless cacti translated into Spanish by Professor Luis A. Beauregard, Director General of Public Instruction of Campeche, Mexico.

I have sent to the professor a textual copy of your honored letter.

I have, sir, the honor to be

Your most obedient servant,

P. ORNELAS.

"It produces tremendous tonnage; it requires no irrigation; it is an excellent dairy roughage, good roughage for any cattle, and can be used for hogs, chickens, sheep and goats. It can be fed in a green succulent condition all the year. It has no serious insect or fungous enemies. One planting is good for repeated cuttings. It does not deteriorate with age, but can be fed when five or six years old to even better advantage than when young. It is a certain crop under conditions which cause other crops to be a failure.

"It has been called a 'vegetable that grows fruit.'"

"As a poultry food it is unsurpassed. Poultry will leave alfalfa, lettuce and other green food for cactus leaves."

"The response of this plant to cultivation is phenomenal. We know of no parallel in the history of cultivated crops. The cacti in general are considered plants of slow growth and the fear of Southern Texas is no exception to the general rule. While it might take it five or six years to grow large enough to pay to harvest in the native pastures, it makes a big crop in two years when cultivated. By actual test it grows eight times as fast with good cultivation as it does without cultivation in grassy pastures."

What Prominent People Say of Luther Burbank

"I look to great practical results from Burbank's work among plants."—Thomas A. Edison.

It is said by David Starr Jordan, president of Leland Stanford Junior University, California, that:

"Luther Burbank is the greatest originator of new and valuable forms of plant life of this or any other age."

"No other man has given to horticulture so many valuable things as has Luther Burbank."—Prof. E. J. Wickson, Dean of the Department of Agriculture of the University of California.

"He stands easily at the head of the world's experimentalists in plant life."—W. Atlee Burpee, of Philadelphia, one of the leading seedmen in the United States.

By Dr. L. H. Bailey, professor of botany in Cornell University, New York:

"It is an honor to California that Luther Burbank is its citizen. He is all that he has ever been said to be, and more."

Joaquin Miller, the Poet of the Sierras, said:

"I like to go to Santa Rosa, the home of Luther Burbank, the man who is helping God make the earth more beautiful."

"In all Europe there is no one who can even compare with Luther Burbank. The time will come when he will be as well known and as highly cherished in California as he now is among the scientific men of Europe. He is a unique, great genius."—Hugo De Vries, of Amsterdam, Holland, the leading botanist of Europe.

"Mr. Burbank is a man who does things that are of much benefit to mankind, and we should do all in our power to help him."—Theodore Roosevelt.

"Mr. Burbank's greatness, and the magnitude of the value of his achievements are recognized the world over by men best capable of understanding and appreciating both the man and his work."—Congressman E. A. Hayes.

"To Luther Burbank has been granted the knowledge, supreme beyond other men, of the susceptibility of plants to vary under the influence of new environments, delicate manipulation and intelligent direction."—Scientific American.

"The man who always does most says the least. Your good works will bless humanity long after you have said 'Good night.' Your work is always a source of inspiration to me, and I am continuously wondering 'What will he accomplish next?'"—Col. G. B. Brackett, Pomological Chief U. S. Dept. of Agriculture, Washington, D. C.

"While I have long been impressed with your work, I am now overwhelmed with the vast amount of good which you have been able to accomplish. I respect your work above all that has ever been done for horticulture."—Prof. Wm. B. Alwood, Virginia College and Experiment Station.

PRICE LIST AND ORDER BLANK

Burbank's Spineless Cactus

The Luther Burbank Company

San Francisco, California

FOR FORAGE CUTTINGS

	Each	Ten	100	1000
Selected Forage Cactus	.60	\$5	\$40	\$300

FOR FRUIT CUTTINGS

	Each	Ten	100
YELLOW FRUIT	\$2	\$15	\$100
CRIMSON FRUIT	\$1.50	\$12	\$75

Please ship via the following cactus cuttings:
State whether express or freight

Ship.....

State when to ship

FOR FORAGE

Number of Cuttings

Price

.....	Selected Forage Cactus	\$.....
	<u>FOR FRUIT</u>	
.....	Yellow Fruit.....	\$.....
.....	Crimson Fruit	\$.....

Enclosed find.....
State whether check, draft or money order

for \$.....in payment of the above order

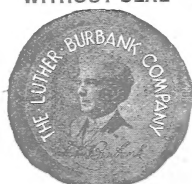
Write plainly. Name.....

Shipping Address(Town)
(County)

Date.....191.....(State)

If shipping destination and Post Office are different, give Post Office Address below.

NONE
GENUINE
WITHOUT SEAL



TRADE MARK
THIS SEAL GUARANTEES
A GENUINE
LUTHER BURBANK
PRODUCTION

All plants and cuttings lightly and carefully packed with *No charges for boxes or packing. Freight or Express Charges to be paid by the purchaser. No cuttings sent by mail.*

All orders must be accompanied by the purchase price.

The right is reserved to reject any order.

See last page of Catalogue for shipping information.

Orders for future delivery will be accepted, if accompanied by a cash deposit of 25 per cent of the total purchase price.

So

How to Order

Wherever it is possible to do so, use the order blank.

Fill out all the information that the blank spaces call for.

Be sure to write your name plainly. Give postoffice where you receive your mail, including County name. State plainly the town or point where you receive your freight.

Give the name of the Railroad or Express company from which you receive your freight. State whether to ship by freight or express. In the absence of specified instructions, we shall use our judgment.

Usually orders will be shipped by freight unless otherwise specified. An exception to this rule will be where the package is small, when it may be shipped by express. No shipments are made by mail.

You will be notified of shipment. Allow a sufficient length of time for the package to arrive, and then if it does not arrive notify the railroad or express company, showing the bill of lading. Also notify us by mail and we will send a tracer after it.

We are not responsible in any manner after we have delivered the shipment in proper condition to the carrier. We will do all in our power, however, to straighten out any difficulty. All claims for defective or damaged goods must be made immediately upon receipt of same.

Nothing will be sent C. O. D.

All remittances must be either postal orders, bank drafts or certified checks, properly made out to this company.

OUR GUARANTEE.

We guarantee the seeds, plants or trees sold by this company true to name, and will replace any that may prove otherwise through a possible error, or will refund the original purchase price. Our liability upon any article sold is limited to the amount of the original purchase price, and all sales are made with this understanding.

The Luther Burbank Company

GENERAL OFFICES

Exposition Building, Pine and Battery Sts.
San Francisco, California

A WARNING

MANY new trees, plants and seeds are grossly misrepresented by a few dealers who trade on the reputation of reliable firms, often doing a thriving business by selling trees and plants in localities where they very well know that they cannot thrive; this and the substitution of inferior or wholly worthless trees or plants under the name and reputation of good ones has been, and is now being carried on persistently and systematically by several parties who victimize those who deal with them by trading on the reputations of reliable firms and good trees.

An especially cruel form of this is the persistent pushing of the Spineless Cactus, Crimson Winter Rhubarb and other tender plants for cold climates, which cannot live where the ground freezes an inch in depth.

It should be the duty and privilege of every good citizen to aid in exposing and routing all who are obtaining money under these false pretenses.

Having been in business almost forty years, millions of trees and plants raised in my establishment are now bearing fruit, not only in the Western United States, but everywhere on earth where the sun shines and trees can be grown. Does this forty years' record of just dealing mean anything, and is it surprising that such a reputation should be worth trading on? *Counterfeit coins are not counterfeited—it is the genuine ones that are misrepresented.*

Luther Burbank
